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35

COMPLETE SPECIFICATION

**PORTABLE MIXING APPARATUS**

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We, POWERPAC TOOLS LIMITED, a New Zealand company, of PO Box 50 522,  
Porirua, New Zealand, do hereby declare the invention for which we pray that a patent  
may be granted to us, and the method by which it is to be performed, to be particularly  
described in and by the following statement:

## PORTABLE MIXING APPARATUS

### TECHNICAL FIELD

- 5 This invention relates to portable mixing equipment and parts and fittings therefor. More particularly, but not exclusively, this invention relates to a tiltable bowl adapted to mix compounds and be moved from an area of preparation of the compounds to an area for dispensing the compounds, as required.

### 10 BACKGROUND ART

- Conventional equipment for mixing larger quantities of compounds, cement or concrete and the like, generally comprise a large fixed bowl with a mixing paddle driven to mix the compound and then tilt or drain the bowl to move the compound into a transporter
- 15 such as a wheelbarrow. The wheelbarrow then takes the compound to the site being used. It is a disadvantage to use such fixed equipment as additional equipment may be required to move compounds, as well as the additional handling time that may be required for such operations.
- 20 Conventional portable mixing equipment includes a concrete mixer. However, concrete mixers generally have static paddles attached to the inside wall of the bowl, and the bowl is rotated by drive means. Such mixing may be suitable for concrete compounds but may not be suitable for properly and fully mixing other compounds. Further, the whole bowl is being rotated by gears or roller means, the drive means may
- 25 be cumbersome to manage rotating such a load and thus such equipment can use more power to mix compounds. Furthermore, the control over the mixing process is limited as the bowl is simply rotated, usually at a fixed angle, and some compounds located in peripheral areas of the bowl may not be properly mixed.
- 30 It is an object of the invention to provide a portable mixing apparatus that overcomes at least some of the abovementioned problems, or at least to provide the public with a useful choice.

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## SUMMARY OF THE INVENTION

According to a broad aspect of the invention there is provided a portable mixing  
5 apparatus, the apparatus including a bowl and a base, the base being provided with  
wheel means pivotably attached thereto, the bowl being adapted with a frame means,  
the frame means being adapted to support a bowl mixer means, and wherein a bowl  
tilting means is attached to the base and is pivotably attached to the frame means, in  
use, to allow the bowl to be tiltable between a first substantially upright position and a  
10 second tilted position.

Preferably the bowl tilting means includes a locking lever arm and an elongate slot  
extending therefrom, and a pin being associated with the bowl, the pin is locatable in  
the slot, in use, for allowing a user to tilt the bowl between the first substantially upright  
15 position and the second tilted position, wherein the pin reaches the end of the slot to  
limit the tilting angle of the bowl.

Desirably a cradle handle is attached to the frame means. Advantageously the bowl is  
substantially circular in form, and wherein the opening of the bowl has a protruding  
20 spout portion wherein the end of the spout portion on the rim of the bowl is higher than  
the opposite side of the rim of the bowl. Preferably the spout portion is provided with  
two opposing flanges extending inwardly of the rim of the bowl on adjacent sides of the  
spout opening.

25 Preferably the base portion of the bowl forms a curved or round shape without corners.

Desirably the frame means includes a pair of spaced apart straps attached about the  
outer circumference of the bowl. Preferably the frame means includes a mounting  
column, the mounting column being adjustable to allow a mixer to be set at the  
30 required distance, in use, from compounds being mixed in the bowl.

Additionally a clamping means is attached to the mounting column, in use, to releasably attach the mixer to the apparatus. Advantageously the base is provided with two spaced apart substantially vertically disposed columns extending therefrom, and wherein the bowl tilting means is pivotally attached between the columns.

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Preferably the wheel means includes four spaced apart castors pivotally attached to the underside of the base. Alternatively the wheel means includes at least two spaced apart pneumatic wheels pivotally attached to an axle assembly, the axle assembly being attached to the underside of the base. Preferably the wheel means includes two spaced apart pneumatic or solid wheels pivotally attached to an axle assembly at one end of the base, and having two spaced apart feet at the other end of the base.

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#### BRIEF DESCRIPTION OF THE DRAWINGS

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Preferred embodiments of the invention will now be illustrated, by way of examples only, with reference to the accompanying drawings in which:

**Figure 1:** Shows a perspective view of the mixing apparatus with a bowl in a first substantially upright position according to a preferred embodiment of the invention;

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**Figure 2:** Shows the mixing apparatus of figure 1 in a second tilted position; and

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**Figure 3:** Shows a base according to an alternative embodiment of the invention.

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#### DETAILED DESCRIPTION OF THE DRAWINGS

Referring to figures 1 and 2, a portable mixing apparatus, generally referred to as 1, according to a preferred embodiment of the invention, is illustrated.

The mixing apparatus 1 includes a bowl 2 and a base 3. Conventional rims for mixing and pouring vessels are generally rounded, and may have a part of the rim adapted to form a spout opening or beak. In the bowl 2 of the invention, the bowl 2 is preferably  
5 provided with a spout portion 2a. The spout portion 2a is considered to be advantageous as it is designed with a protruding and raised spout portion 2a that is combined with inwardly projecting flanges 4 to form a novel design feature.

The spout portion 2a is seen to be desirably adapted to direct the flow of fluid  
10 compounds from the bowl without overly restricting the flow of fluid compounds. The shape and position of the flanges 4 allow for a sufficient spout opening or beak to enable an operator to have better control over the flow of the mixed compounds from the bowl 2.

15 It is also seen that the bowl 2 is desirably curved or circular in form and does not have any corners in the area within which fluid compounds are mixed. Desirably the base portion 5 of the bowl is curved or rounded to facilitate good mixing of the fluid compounds. It is seen that a flat base portion would create a corner and unmixed compounds can be trapped adjacent the curved corner which is undesirable. As the  
20 base portion 5 is completely curved with no corners, it is seen that good mixing of the compound is achievable, depending on the type of paddle or mixer 20 used in the fluid compound.

Different mixers 20 produce different results and it may be important to select a suitable  
25 mixer 20 for mixing the fluid compounds in the bowl depending on factors as the type and density of the fluid compounds.

The bowl 2 may be provided with a shoulder 6 about the outer surface to enable a securing member 7 in the form of a strap that forms part of a frame means to snugly fit  
30 into the shoulder 6 and retain the bowl 2 in place. The strap 7 is preferably made of metal. Desirably a second strap 8 may be fitted about the outer circumference of the bowl and be attached to the strap 7 by two spacer plates 9 on either side of the bowl 2.

The spacer plates 9 are adapted with pivot means 10 that are pivotally associated with the base 3. Desirably the bowl tilting means includes two spacer plates 9, the pivot means 10 and associated spacer plates 9 being positioned on opposite sides of the bowl 2 to create a pivoting or tilting action of the bowl 2.

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The pivot means 10 are desirably cylindrical rods. The cylindrical rods 10 are attached to the plates 9 and project from respective spacer plates 9 located at opposite sides of the bowl 2 to locate in respective apertures (not shown) made in respective adjacent base columns 11a, 11b. The columns 11a, 11b are desirably flared at the lower end, 10 and are attached to the base 3.

A tilting lock lever arm 27 is preferably provided on at least one side of the bowl 2 adjacent the columns 11a, 11b. In this embodiment one lever arm 27 is advantageously provided adjacent the column 11b. As seen, the tilting lock lever arm 27 is pivotally 15 attached by pivot means 28 to the column 11b at a point adjacent the near end of the lever arm 27 and at the near end of an elongate slot 25. This can be achieved by the lever arm 27 having an aperture (not shown) through which a bolt passes and is secured to a plate within the column 11b with an equivalent aperture being aligned to allow the bolt to pass through. Other arrangements may be made within the scope and spirit of 20 the invention to achieve the desirable tilting lock lever arm action.

The elongate slot 25 is configured to be associated with a pin 26 that is attached to the strap 7 and is configured to be slidable within the slot 25 to enable the bowl 2 to move between a substantially upright first position and a second tilted position as the 25 pin 26 slides along the slot 25.

When the bowl 2 is in the first upright position the lever arm 27 is "locked" in that it is configured and arranged so that the bowl 2 can not be tilted about the pivot points 10 without the lever arm 27 being operated. This is achieved by an arrangement wherein 30 the longitudinal axis of the elongate slot 25 is aligned transversely to the direction of travel of the pin 26.

In operation, to tilt the bowl 2 from the secured first substantially upright position when mixing compounds as shown in figure 1 toward the second tilted position as seen in figure 2, the tilting lock lever arm 27 is released from a "locked" position by a user pushing the lever arm 27 downwards to align the longitudinal axis of the slot 25 with the direction of travel of the pin 26 about the pivot points 10. A user then pushes the cradle handle 13 forward toward the spout portion 2a and the bowl 2 tilts.

It is seen in figure 2 that the lever arm 27 can also function to stop the bowl 2 from tilting over completely as the pin 26 reaches the end of the slot 25 to limit the tilting angle of the bowl 2.

The frame means for supporting the mixer means and as an aid for the tilting operation of the bowl 2 includes either or both of the straps 7, 8 attached to a strap block or blocks 12, and the strap blocks 12 being attached to a handle 13. The cradle handle 13 can function as an aid for tilting the bowl 2 in conjunction with the operation of the level arm 27. The handle 13 can be in the form of a tubular parallelogram or other four-sided shape or other tubular frame shape that allows a user to have better control over the bowl 2 and contents during the tilting/pouring operation of the bowl 2.

The frame means includes an adjustable mounting column in the form of a sleeve 15 and a mounting column 16 operable for supporting a mixer means. The sleeve 15 is desirably tubular and is attached to the handle 13. The mounting column 16 is configured to slide in a reciprocal motion within the sleeve 15.

A clamping means in the form of a clamping arm 17 is attached at the top end of the mounting column 16. The arm 17 can releasably secure the mixer means by operation of a clamp 18. The mixer means may be a power drill 19 into which a rotatable mixing paddle 20 is fitted.

Preferably a support arm 14 is attached between the top end of the sleeve 15 and the handle 13.

The mounting column 16 can be height adjusted to position the mixing paddle 20 in a desired position within the bowl 2, and with considering different lengths of paddles that may be used in the mixing operation.

- 5 A lock pin 21 is mounted on the sleeve 15 and secures or locks the mounting column 16 in the desired position. The mounting column 16 can have at least two working positions and in this one embodiment the column 16 and clamping arm 17 have two working positions, the first position being over the bowl 2 and the second position being 180 degrees from that by facing the rear of the apparatus 1 outside the bowl 2.
- 10 This is achieved by the cross section of the column 16 and sleeve 15 being rectangular and thus the column 16 may be reversed in the sleeve 15.

- When in the first working position the paddle 20 is on an angle projecting into the bowl 2 (as seen clearly in figure 1). It will be seen that the angle of the column to the
- 15 clamping arm 17 may be such that when the column 16 is reversed to the second working position the arm 17 is substantially horizontally disposed and therefore the mixing paddle 20 when clamped in position can be vertically disposed outside the apparatus 1. As the column 16 is adjustable, it can be moved to set the required height above a secondary bowl (not shown for mixing secondary compounds in the secondary
  - 20 bowl positioned adjacent the cradle handle 13 or base 3.

The base 3 is provided with wheel means desirably in the form of castors 22. The castors 22 preferably swivel for greater manoeuvrability of the apparatus 1. Desirably the base 3 has a U shape with the open end facing the pouring direction of the bowl 2.

- 25 Preferably four castors 22 are spaced apart and releasably attachable to the underside of the base 3 by way of bolts 29. Advantageously at least two of the castors 22 are provided with a brake 23 to secure the apparatus 1 in position when compounds are being mixed.

- 30 The base 3 desirably includes reinforcing means 24 in the form of a bar or plate for increased strength of form and stability. The base reinforcing means 24 may include the



castor plate or any other form of stabilising and reinforcing the U-shaped chassis forming part of the base 3. The base 3 and the frame can be made of any suitable durable and resilient material such as, for example, steel, aluminium, alloys, timber, plastics material or a combination thereof. The bowl 2 can be made of any suitable  
5 durable and resilient material and can desirably be made of polyethylene or other such plastics material.

In operation, when compounds and mixtures are to be poured or dispensed from the bowl 2, the lever arm 27 releases the bowl 2 from its locked or secured state in the first  
10 upright position by pushing the level arm 27 down to rotate the slot 25 about the pivot point 28 to lift the distal end of the slot upwards. A user also pushes the cradle handle 13 to slide the pin 26 along the slot 25. This will act to tilt the bowl 2 about the pivots 10 to the desired second tilted position as shown in figure 2.

15 Referring to figure 3, a base, generally referred to as 30, according to an alternative embodiment of the invention, is illustrated.

The base 30 for the bowl 2 is designed for use on more uneven or metal surfaces such as gravel and the like. The base 30 for purposes of this description is similar to that of  
20 base 3 as in figures 1 and 2, and aspects of the design will not be repeated. The bowl 2 and other parts are interchangeable and it is seen that a user may change the wheel means for that described with the preferred embodiment to this alternative embodiment.

The U shaped chassis 31 and columns 11a, 11b are similar to the base 3 in figure 1.  
25 The wheel means in this alternative embodiment includes at least two spaced apart wheels 32 pivotally attached to an axle assembly including an axle 33. The wheels 32 may be pneumatic or solid as required.

The axle 33 may be attached permanently by being welded, or more desirably by  
30 fastening means in the form of bolts (not shown), to respective spaced apart plates 24 on the chassis 31 by the use of mounting brackets 34 having top plates (not shown).

The wheel means also desirably includes two spaced apart feet 35. The feet 34 are attached permanently by being welded, or by fastening means in the form of bolts (not shown), to respective spaced apart plates 24 on the chassis 31 by the use of mounting brackets 36. It will be appreciated that the length of the feet can be determined by the diameter of the wheels 32 and the angle required of the feet to form a substantially horizontally aligned chassis 31.

The materials of the apparatus 1 are formed of any suitable and durable material including but not limited to any one or more of the following: steel, alloys, plastics material, timber, ceramics, glass, and/or rubber. Desirably most of the materials used in the base 3 are made of steel.

It is seen that the apparatus 1 is a stable platform for the mixing of compounds, the portable movement of such compounds if required, and the controlled pouring of compounds from the bowl 2. This apparatus 1 has many applications, and giving that the base 3 or base 30 can be interchangeable, it can be used on a variety of surfaces, as required.

Wherein the foregoing reference has been made to integers or components having known equivalents, then such equivalents are herein incorporated as if individually set forth. Accordingly, it will be appreciated that changes may be made to the above described embodiments of the invention without departing from the principles taught herein.

It is to be understood that the above description is intended to be illustrative, and not restrictive. Additional advantages of the present invention will become apparent for those skilled in the art after considering the principles in particular form as discussed and illustrated. Thus, it will be understood that the invention is not limited to the particular embodiments described or illustrated, but is intended to cover all alterations or modifications which are within the scope of the appended claims.

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Claims:

1. A portable mixing apparatus, the apparatus including a bowl and a base, the base being provided with wheel means pivotably attached thereto, the bowl being adapted with a frame means, the frame means being adapted to support a bowl mixer means, and wherein a bowl tilting means is attached to the base and is pivotably attached to the frame means, in use, to allow the bowl to be tiltable between a first substantially upright position and a second tilted position.
2. An apparatus according to claim 1 wherein the bowl tilting means includes a locking lever arm and an elongate slot extending therefrom, and a pin being associated with the bowl, the pin is locatable in the slot, in use, for allowing the bowl to be tilted between the first substantially upright position and the second tilted position, wherein the pin reaches the end of the slot to limit the tilting angle of the bowl.
3. An apparatus according to either claim 1 or claim 2 wherein a cradle handle is attached to the frame means.
4. An apparatus according to any one of the preceding claims wherein the bowl is substantially circular in form, and wherein the opening of the bowl has a protruding spout portion wherein the end of the spout portion on the rim of the bowl is higher than the opposite side of the rim of the bowl.
5. An apparatus according to claim 4 wherein the spout portion is provided with two opposing flanges extending inwardly of the rim of the bowl on adjacent sides of the spout opening.
6. An apparatus according to any one of the preceding claims wherein the base portion of the bowl forms a curved or round shape without corners.

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7. An apparatus according to any one of the preceding claims wherein the frame means includes a pair of spaced apart straps attached about the outer circumference of the bowl.
- 5 8. An apparatus according to claim 7 wherein the bowl mixer means includes a mounting column attached to the straps, the mounting column being adjustable to allow a mixing unit means to be mounted at a required distance, in use, from compounds being mixed in the bowl.
- 10 9. An apparatus according to claim 8 wherein a clamping means is attached to the mounting column, in use, to releasably attach the mixer to the apparatus.
10. An apparatus according to any one of the preceding claims wherein the base is provided with two spaced apart substantially vertically disposed base columns extending therefrom, and wherein the bowl tilting means pivotally attaches the bowl to the inside of the columns.
- 15 11. An apparatus according to claim 9 wherein the base includes a U shaped chassis upon which the base columns are attached, and wherein the bowl, in use, tilts toward the open end of the U shaped chassis when being moved to the second tilted position.
- 20 12. An apparatus according to any one of the preceding claims wherein the wheel means includes four spaced apart castors pivotally attached to the underside of the base.
- 25 13. An apparatus according to any one of claims 1 to 11 wherein the wheel means includes at least two spaced apart wheels pivotally attached to an axle assembly, the axle assembly being attached to the underside of the base.
- 30 14. An apparatus according to claim 13 wherein the wheel means includes



15. An apparatus according to either claim 13 or claim 14 wherein the wheel means includes two spaced apart wheels pivotally attached to an axle assembly at one end of the base, and having two spaced apart feet at the other end of the base.
- 5 16. An apparatus according to claim 1 substantially as herein described with reference to any one of the preceding claims.

10 POWERPAC TOOLS LIMITED  
By their Attorneys  
SCHUCH & COMPANY  
per:

A handwritten signature in black ink, appearing to be 'SV' with a long horizontal flourish extending to the right.

END OF CLAIMS

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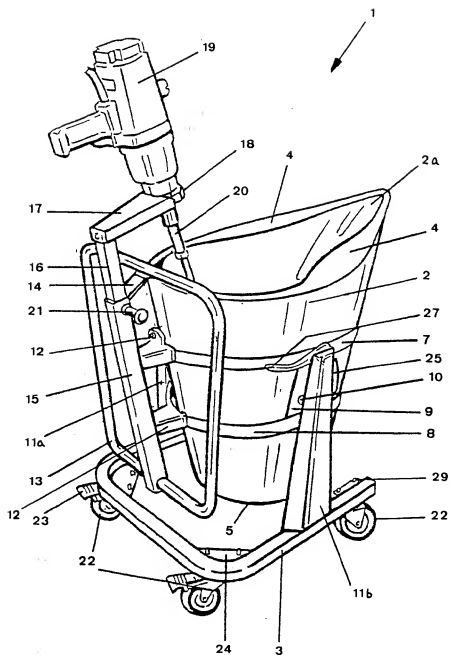


Figure 1

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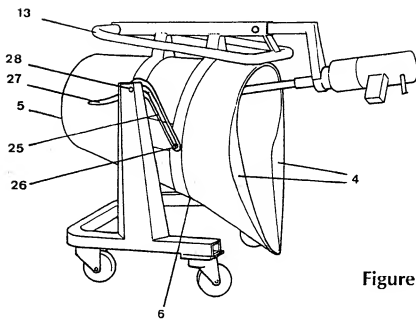


Figure 2

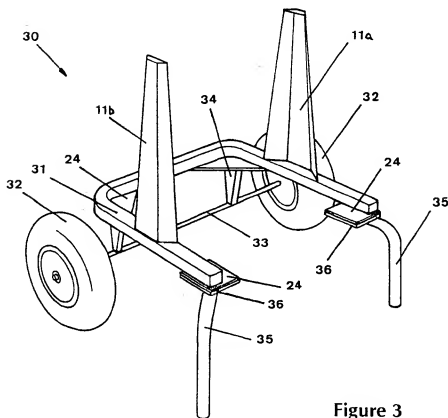


Figure 3